

loaded into said loadlock and through which a processed substrate may be unloaded from said loadlock;

a transfer aperture through which an unprocessed substrate may be delivered from said loadlock to said transfer chamber and through which a processed substrate may be delivered from said transfer chamber to said loadlock;
and

a heating element disposed above said single substrate upper support.

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12/39 (amended) A substrate processing system as in claim 38, wherein said loadlock further comprises a middle plate disposed above said cooling plate and below said heating element.

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13/40 (amended) A substrate processing system as in claim 39 wherein said single substrate upper support is connected to said middle plate.

14/41 (amended) A substrate processing system as in claim 40, further comprising a gas inlet to supply a gas to said loadlock.

15/42 (amended) A substrate processing system as in claim 41, wherein said loadlock includes a top surface, said gas inlet being located along said top surface of said loadlock.

Please add new claims 98-135 as follows:

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16/98 A loadlock comprising:
a first structure adapted to support a first substrate;
a second structure adapted to support a second substrate;
a cooling plate disposed below said first structure; and
a third structure coupling said first and second structures to one another, said third structure adapted so that said first and second structures move together in a vertical direction independent of said cooling plate.

~~17~~ 99. A loadlock as in claim ~~98~~, further comprising a heating device disposed above said first structure.

~~18~~ 100. A loadlock as in claim ~~99~~, further comprising a top plate disposed between said heating device and said first structure.

~~19~~ 101. A loadlock as in claim ~~98~~, wherein said first structure includes a plurality of supports adapted to support a glass substrate.

~~20~~ 102. A loadlock as in claim ~~98~~, wherein said second structure comprises a plurality of pins attached to a lower plate.

~~22~~ 103. A loadlock as in claim ~~98~~, further comprising a first aperture located on a first side of said loadlock and a second aperture located on a second side of said loadlock.

~~23~~ 104. A loadlock as in claim ~~103~~, further comprising a processing substrate positioned on said second structure and an unprocessed substrate positioned on said first structure.

~~24~~ 105. A loadlock as in claim ~~102~~, further comprising an elevator coupled to said lower plate, the elevator adapted to change a vertical position of said first, second and third structures while said cooling plate remains stationary.

~~26~~ 106. A loadlock for processing display substrates, comprising:
a chamber body defining a first aperture on a first side surface and a second aperture on a second side surface;

an upper support adapted to support a display substrate;

a middle plate connected to said upper support;

a lower support adapted to support a display substrate;

a lower plate connected to said lower support;

a single cooling plate positioned in said chamber, said single cooling plate being

positioned between said middle plate and said lower plate;
a heating element disposed above said upper support; and
an upper plate positioned above said upper support;
wherein said upper plate, middle plate, and lower plate are connected to each other so that
said upper plate, middle plate, and lower plate can move together in a vertical direction
independent of said cooling plate.

~~25~~ 107. A loadlock as in claim ~~106~~, further comprising a processed display substrate on
said lower support and an unprocessed display substrate on said upper support at the same time.

~~26~~ 108. A loadlock as in claim ~~106~~, wherein said display substrates comprises glass.

~~27~~ 109. A loadlock as in claim ~~106~~, wherein said upper support and said lower support are
sized to accept a glass substrate having a rectangular shape including a length of at least 650 mm
and a width of at least 830 mm.

~~28~~ 110. A loadlock as in claim ~~106~~, further comprising a gas inlet and a gas supply, said
gas supply including helium gas.

~~29~~ 111. A loadlock as in claim ~~110~~, further comprising a filter disposed adjacent to said
gas inlet.

~~30~~ 112. A loadlock as in claim ~~106~~, further comprising an elevator coupled to said lower
plate and adapted to move said lower plate, said middle plate and said upper plate in a vertical
direction, wherein said cooling plate is stationary when said lower plate, said middle plate and
said upper plate are moved by said elevator.

~~31~~ 113. A loadlock as in claim ~~106~~, wherein said middle plate includes a cooling layer and
an insulation layer.

32 114. A loadlock system comprising:
a loadlock chamber;
a lower plate having a plurality of supports extending therefrom, said supports adapted to accept a single substrate;
a cooling plate disposed in said chamber, said cooling plate positioned to accept a single substrate from said support structure, said cooling plate including a plurality of apertures therethrough that are sized to accept said supports;
said lower plate being spaced apart from and below said cooling plate; and
said lower plate and plurality of supports being adapted to move in a vertical direction independent of said cooling plate.

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33 115. A loadlock system as in claim 114, further comprising a middle plate having a plurality of supports extending therefrom, said supports adapted to accept a single substrate, said middle plate positioned above said cooling plate.

34 116. A loadlock system as in claim 115, wherein said middle plate and said lower plate are connected to each other and adapted to move together in a vertical direction.

35 117. A loadlock system as in claim 116, further comprising an upper plate positioned above said middle plate and coupled to said middle plate and said lower plate so that said upper plate, middle plate and lower plate move together in a vertical direction.

36 118. A loadlock system as in claim 115, further comprising a heating element positioned above said middle plate.

37 119. A loadlock system as in claim 114, further comprising an elevator connected to said lower plate and adapted to change a vertical position of said lower plate and plurality of supports while at the same time said cooling plate remains in a fixed vertical position.

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120. A loadlock system comprising:

a loadlock chamber;
a lower support adapted to support a substrate in said loadlock chamber;
an upper support adapted to support a substrate in said loadlock chamber;
a cooling plate positioned between said lower support and upper support in said loadlock chamber, said cooling plate adapted to support a substrate; and
an elevator coupled to said lower support and said upper support, said elevator adapted to change a vertical position of said lower support and said upper support while at the same time said cooling plate remains in a fixed vertical position.

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121. A loadlock system as in claim 120, further comprising a heating element positioned above said upper support in said loadlock chamber.

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122. A loadlock system as in claim 121, further comprising a first aperture positioned on a first side of said loadlock chamber and a second aperture positioned on a second side of said loadlock chamber, wherein said upper support, said lower support, and said cooling plate are positioned between said first aperture and said second aperture.

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123. A loadlock system as in claim 120, further comprising a gas inlet adapted to supply a gas to said loadlock chamber.

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124. A loadlock system as in claim 123, wherein a gas comprising helium is supplied to said loadlock chamber.

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125. A loadlock system as in claim 123, wherein a gas comprising helium and nitrogen is supplied to said loadlock chamber.

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126. A loadlock as in claim 125, wherein said gas supplied to said loadlock chamber has a nitrogen pressure of 754-759 torr and a helium pressure of 1-6 torr.

43 127. A loadlock system as in claim 123, wherein said loadlock chamber includes a top surface, said gas inlet being located along said top surface of said loadlock chamber.

46 128. A processing system comprising:
at least one processing chamber;
a transfer chamber connected to said at least one processing chamber; and
a loadlock connected to said transfer chamber, said loadlock comprising:
a lower support adapted to support a substrate;
an upper support adapted to support a substrate;
a cooling plate positioned between said lower support and upper support,
said cooling plate adapted to support a substrate; and
an elevator coupled to said lower support and said upper support, said
elevator adapted to change a vertical position of said lower support and said
upper support while at the same time said cooling plate remains in a fixed vertical
position.

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47 129. A processing system as in claim 128, wherein said at least one processing chamber comprises at least one chamber selected from the group consisting of a physical vapor deposition chamber, a chemical vapor deposition chamber, an etching chamber, and a heating chamber.

48 130. A processing system as in claim 128, further comprising an external substrate supply station including:
a first robot to deliver substrates to said loadlock and pick up substrates from said loadlock;
at least one unprocessed substrate cassette to supply unprocessed substrates to said loadlock; and
at least one processed substrate cassette to accept processed substrates from said loadlock.

49 131. A processing system as in claim 130, further comprising a second robot to transfer a substrate between said loadlock and said transfer chamber.

50 132. A substrate processing system including at least one processing chamber and a transfer chamber connected to the at least one processing chamber, the system further including a loadlock comprising:

a single substrate upper support and a single substrate lower support;

a transfer aperture adapted to transfer a single substrate between said transfer chamber and said loadlock;

a cooling plate disposed in said loadlock and positioned to accept a single substrate from said single substrate lower support;

a cassette structure connecting said single substrate upper support and said single substrate lower support while being unconnected to said cooling plate; and

an elevator adapted to raise and lower said cassette structure so that said single substrate upper support and said single substrate lower support move together while said cooling plate remains in a fixed position.

51 133. A substrate processing system as in claim 132, the loadlock further comprising a heating element disposed above said single substrate upper support.

52 134. A substrate processing system as in claim 132, the loadlock further comprising a cooling gas comprising helium and nitrogen.

53 135. A substrate processing system including a loadlock and a transfer chamber, comprising:

first support means for supporting an unprocessed substrate in the loadlock;

means for heating the unprocessed substrate on the first support in the loadlock;

second support means for supporting a processed substrate in the loadlock, the second support means being located below the first support means;

coupling means for coupling the first support means and the second support means